COMMONWEALTH of VIRGINIA

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MEMORANDUM

TO: Regional Directors

FROM: John M. Daniel, Jr., P.E., DEE
Director, Division of Air Program Coordination

SUBJECT: Memo Number 03-1009 – Nitrogen Oxides Emissions during Fuel Transfers for GE Frame 7FA turbines using Model 2.6 Dry Low NOx Burners

DATE: November 22, 2003

Copies: Rick Weeks, Air Permit Managers, Air Compliance Managers

REFERENCES: Code of Virginia, Applicable State and Federal Statutes and Regulations

The following policy on the limits on Nitrogen Oxides (NO_x) emissions applies to General Electric Model Frame 7FA fuel combustion turbines using Dry Low NO_x 2.6 burners (GE 7FA DLN 2.6). This policy will apply only to GE 7FA DLN turbines operating in the simple-cycle mode. This policy will apply to existing equipment meeting this definition and any future installations of this type of combustion turbine.

The basis of this policy will be the Virginia Administrative Code citation 9 VAC 5-50-20 E. All operational practices have to be in compliance with this citation as described below:

> At all times, including periods of startup, shutdown, soot blowing and malfunction, owners shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with air pollution control practices for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the board, which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source.
> (9 VAC 5-50-20 E)

The GE 7FA DLN 2.6 can meet the current Virginia best available control technology (BACT) emission limitations for NO_x. However these low emission rates can only be maintained while the turbine is producing electricity under normal workload conditions. During fuel transfers NO_x emission concentrations may exceed these emission concentration limits. Fuel transfers are divided into two groups.

Event 1 - Automatic or Operator Initiated Fuel Transfer from Pipeline Natural Gas to Fuel Oil
The period will begin when gas usage is first reduced for the purpose of transferring to oil and end when fuel oil consumption and water injection have stabilized.

Event 2 - Operator Initiated Fuel Transfer from Fuel Oil to Pipeline Natural Gas
The period will begin when the turbine's work load is reduced for the purpose of transferring to natural gas and end when oil usage ceases and the turbine is re-stabilized in a normal workload for the Dry Low NO_x burners.

A review of the operations has demonstrated that fuel transfer has a measurable environment benefit over the alternative of first shutting down and then restarting the turbine on a second fuel. Therefore fuel transfers will be considered acceptable "Alternate Operating Scenarios" (AOS). The VADEQ will address these AOS events by including enforceable permit conditions that limit the period of excess emissions to no greater than two (2) 1-hour averaging periods per event. The permit will also specify recordkeeping and reporting provisions for tracking compliance. Continuous Emission Monitoring must be maintained during all periods of operation, including fuel transfer and all emissions will be included in computing the annual air emission totals. These requirements are defined in the proposed permit condition (Paragraph A) provided below.

The following paragraph is an example "boilerplate" operating permit condition that can be utilized to modify existing permits and for future installations of this model of the GE 7FA DLN 2.6 air emission source.

A. Boilerplate Condition for Fuel Transfers

A fuel transfer operation when compared to shutting the unit down and then restarting it on a second fuel results in significantly reduced total air emissions. Air emission concentrations above stated permit limitations resulting from fuel transfers shall not be considered a deviation provided:

1. Air pollution control practices for minimizing emissions are adhered to and the duration of excess emissions shall be minimized but in no case exceed two 1-hours averaging periods for any given fuel transfer event unless specifically authorized by DEQ for longer duration.

2. The permittee shall provide a general description to the Director of the VADEQ

Regional Office of the procedures to be followed during periods of fuel transfer to ensure that the best operational practices to minimize emissions will be adhered to and the duration of excess emissions will be minimized. The description may be updated as needed by submitting such update to the Director within thirty (30) days of implementation.

3. Excess emissions during the fuel transfer procedure will be recorded and included in the quarterly Excess Emission Report.
   (9 VAC 5-80-180 J and 9 VAC 5-50-20 E)

Questions or comments on this guidance should be directed to the Office of Air Permit Programs.